

CLAIMS

1. A method for locating a mobile terminal in a communications network, the method comprising the steps of :
 - estimating a location of the mobile terminal; and
 - applying one of a plurality of available methods to calculate a region around the estimated location in which the terminal could be located.
2. A method according to claim 1, wherein the step of estimating a location of the mobile terminal is performed using multiple sources of information.
3. A method according to claim 2, wherein the network comprises multiple cells and each source of information comes from a respective one of the multiple cells.
4. A method according to claim 2 or claim 3, wherein the mobile terminal is served by multiple cells of the network simultaneously and each source of information comes from a respective one of the multiple cells.
5. A method according to any preceding claim, wherein the step of estimating a location of the mobile terminal comprises the steps of selecting and applying a preferred method for estimating the location from a number of available methods.
6. A method according to claim 5, wherein if the selected method for estimating the location is unsuccessful when applied, the method comprises the further step of sequentially selecting and applying one or more others of the available methods until a selected method is successfully applied.
7. A method according to claim 5 or claim 6, wherein the available methods include : an algorithm using information from one cell of the network; an algorithm using information from multiple cells of the network; and a numerical method using information from multiple cells of the network.

BEST AVAILABLE COPY

8. A method according to any of claims 5 to 7, wherein the preferred method can be specified by setting a variable.
9. A method according to any preceding claim, wherein the step of calculating a region around the estimated location comprises the steps of selecting and applying a preferred method for calculating the region from the plurality of available methods.
10. A method according to claim 9, wherein if the selected method for calculating a region is unsuccessful when applied, the method comprises the further step of sequentially selecting and applying other of the available methods until a selected method is successfully applied.
11. A method according to claim 9 or claim 10, wherein the available methods for calculating the region include : an ellipse algorithm; a circle algorithm; an arc algorithm; and a polygon algorithm.
12. A method according to any of claims 9 to 11, wherein the methods include use of a parameter to calculate the region such that the probability of the mobile's exact location being in that region equals the parameter.
13. A method according to any of claims 9 to 12, as dependent on claim 5, wherein the selected method for estimating the location and the selected method for calculating the region together result in one of a number of shapes of region in which the mobile terminal could be located, the shape depending on the selected method for calculating the region.
14. A method according to any of claims 9 to 13, as dependent on claim 5, wherein the method comprises the further step of applying a rule that specifies which of the possible methods for estimating the location can be used together with what available methods for calculating the region.
15. A method according to any preceding claim wherein the step of estimating a location comprises the step of modelling a cell of the network.

BEST AVAILABLE COPY

16. A method according to any preceding claim, wherein the step of calculating a region around the estimated location in which the mobile terminal could be located comprises the step of modelling a cell of the network.

17. A method according to any preceding claim, wherein the network comprises a service area, the service area containing a number of cells including a cell in which the mobile terminal is located.

18. A method according to claim 17, wherein the service area is represented by the geographical region served by the cells in the service area.

19. A method according to claim 18, wherein the geographical region representing the service area is the region enclosed by a closed curve enclosing all borders of the geographical region served by the cells in the service area.

20. A method according to claim 18 or claim 19, wherein the step of estimating the location comprises a calculation of the mass centre of the geographical region representing the service area.

21. A method according to claim 18 or claim 19, wherein in the step of estimating a location, the network service density is assumed constant over the geographical region representing the service area.

22. A method according to claim 18 or claim 19, wherein the step of calculating a region around the estimated location in which the mobile terminal could be located assumes that the network service density is constant over the geographical region representing the service area.

23. A method according to claim 18 or claim 19, wherein in the step of estimating a location the network service density in the service area is

assumed not constant over the geographical region representing the service area.

24. A method according to claim 18 or claim 19, wherein the step of calculating a region around the estimated location in which the mobile terminal could be located assumes that the network service density is not constant over the geographical region representing the service area.

25. A method according to claim 23 or claim 24, wherein the network service density in any given location of the geographical region representing the service area depends on the number of cells serving that given location.

26. A method according to any preceding claim, applied in a 3GPP telecommunications network.

27. A method according to any preceding claim, applied in a Service Area Identifier location method.

28. A method according to any of claims 1 to 27, applied in a Cell Identity and Round Trip Time location method.

29. A location module apparatus arranged to calculate the location of a mobile terminal in a communications network, the location module comprising :
means for estimating a location of the mobile terminal; and
means for calculating a region around the estimated location in which the mobile terminal could be located.

30. A method for locating a mobile terminal in a communications network, the method comprising the steps of :

applying one of a plurality of available methods to estimate a location of the mobile terminal; and

applying one of a plurality of available methods to calculate a region around the estimated location in which the mobile terminal could be located.

BEST AVAILABLE COPY